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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,987	05/05/2006	Brent E. Green	7865-218 MIS:jb	7282

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EXAMINER	
ML, QIUWEN	
ART UNIT	PAPER NUMBER
1655	
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06/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,987	GREEN ET AL.	
	Examiner	Art Unit	
	QIUWEN MI	1655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19,20,22-26 and 28-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19, 20, 22-26, 28-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicant's amendment in the reply filed on 3/12/08 is acknowledged. The Objection to Oath/Declaration is withdrawn, as the petition for signing on behalf of one inventor was overlooked.

Claims Pending

Claims 1-18, 21, 27, and 55-64 are cancelled. Claims 19, 20, 22-26, 28-54 are pending. Claims 19, 20, 22-26, 28-54 are examined on the merits.

Claim Rejections -35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 26-30 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Murray (US 6,005,076).

This rejection is maintained for reasons of record set forth in the Office Action mailed out on 10/12/2007, repeated below, slightly altered to take into consideration Applicant's amendment filed on 3/12/08. Applicants' arguments filed have been fully considered but they are not deemed to be persuasive.

Murray discloses a method for oil seed protein extraction (see the entire document). Murray teaches extracting rapeseed meal with an aqueous food grade salt solution at a pH of about 5-6.8 at a temperature of about 5-35 °C (col 8, lines 30-40); the extracting step is effected for about 10-60 min (col 8, lines 63-66); the crude protein solution was then chilled to 6 °C for 16 h (col 7, lines 5-8); separating the aqueous protein solution from residual oil seed meal; removing fat from the aqueous protein solution by chilling said aqueous protein solution to a temperature below about 15 °C (col 9, lines 21-26); the fat is separated by decanting, centrifugation and /or fine filtration (claim 7); the supernatant was diafiltered (col 7, lines 45-50), and then concentrated by using a selective ultrafiltration membrane with a molecular weight cut-off of 30,000 (col 7, lines 10-15; claim 13) at a temperature of about 20-45 °C (claim 15); increasing the protein concentration of said defatted protein solution while maintaining the ionic strength thereof substantially constant to form a concentrated defatted protein solution (claim 1d); it is preferred to use a volume reduction factor of about 3.0-about 10 (col 4, lines 55-60); the high protein liquid extract was diluted 10 fold in tap water (6 °C) (col 7, lines 19-21), diluting the concentrated defatted protein solution to cause the formation of discrete protein particles in the aqueous phase (claim 8e, col 9, lines 32-36); settling the protein micelles to form a mass of protein isolate in the form of an amorphous sticky gelatinous, gluten-like protein micellar mass (claim 8f, col 8, lines 52-57); the micellar mass was allowed to settle for 4 h at 3 °C (col 7, lines 50-55); the dry (desolventized) protein micellar mass has a protein content, usually in excess of about 90% protein (calculated as kjeldahl N x 6.25) (col 6, lines 34-38). See Example 2 in particular.

It would have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use all the teaching of Murray in the entirement document although they are not exactly in one embodiment. Since Murray yielded beneficial results in food industry, one of ordinary skill in the art would have been motivated to make the modifications.

Claims 19, 20, 22-26, 28-36, 38-45, and 50-52 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Murray (US 6,005,076) in view of Jones et al (US 4,158,656).

This rejection is maintained for reasons of record set forth in the Office Action mailed out on 10/12/2007, repeated below, slightly altered to take into consideration Applicant's amendment filed on 3/12/08. Applicants' arguments filed have been fully considered but they are not deemed to be persuasive.

Murray discloses a method for oil seed protein extraction (see the entire document). Murray teaches extracting rapeseed meal with an aqueous food grade salt solution at a pH of about 5-6.8 at a temperature of about 5-35 °C (col 8, lines 30-40); the extracting step is effected for about 10-60 min (col 8, lines 63-66); the crude protein solution was then chilled to 6 °C for 16 h (col 7, lines 5-8); separating the aqueous protein solution from residual oil seed meal; removing fat from the aqueous protein solution by chilling said aqueous protein solution to a temperature below about 15 °C (col 9, lines 21-26); the fat is separated by decanting, centrifugation and /or fine filtration (claim 7); the supernatant was diafiltered (col 7, lines 45-50),

and then concentrated by using a selective ultrafiltration membrane with a molecular weight cut-off of 30,000 (col 7, lines 10-15; claim 13) at a temperature of about 20-45 °C (claim 15); increasing the protein concentration of said defatted protein solution while maintaining the ionic strength thereof substantially constant to form a concentrated defatted protein solution (claim 1d); it is preferred to use a volume reduction factor of about 3.0-about 10 (col 4, lines 55-60); the high protein liquid extract was diluted 10 fold in tap water (6 °C) (col 7, lines 19-21), diluting the concentrated defatted protein solution to cause the formation of discrete protein particles in the aqueous phase (claim 8e, col 9, lines 32-36); settling the protein micelles to form a mass of protein isolate in the form of an amorphous sticky gelatinous, gluten-like protein micellar mass (claim 8f, col 8, lines 52-57); the micellar mass was allowed to settle for 4 h at 3 °C (col 7, lines 50-55); the dry (desolventized) protein micellar mass has a protein content, usually in excess of about 90% protein (calculated as kjeldahl N x 6.25) (col 6, lines 34-38).

Murray does not teach washing canola oil seed meal with an alcohol (ethanol), ratio of canola oil seed meal in solvent, wash till no visible color is recovered, diafilatration solution contains an antioxidant (ascorbic), or any claimed amounts of antioxidant, membrane cut off point.

Jones et al (US 4,158,656) teach a process for producing protein concentrate product from rapeseed (see Abstract). Jones et al indicate that the problem is that the rapeseed contains numerous phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments. These can cause an unattractive coloration and undesirable flavour in the food into which they are incorporated and, further, these phenolic

compounds can be strongly bound to the protein and thereby diminish the nutritive value of the product (col 3, lines 25-33). The glucosinolates contained in rapeseed are hydrolysed by myrosinase under the appropriate conditions to isothiocyanates, nitriles, and oxazolidinethiones some of which are known to cause goiter. Rapeseed also contains a yellow pigment, the color intensity of which is very much enhanced in alkaline environments, and such coloration is highly undesirable in many food products (col 3, lines 38-47). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24). Phenolics in the rapeseed flour are easily oxidized in alkaline and neutral solutions in the presence of oxygen and it is therefore essential that the extractions should be conducted in a non-oxidizing medium. It is preferable that the solution contains an antioxidant, such as sulphur dioxide, or ascorbic acid (col 4, lines 65-67; col 5, lines 1-5). Jones et al also teach contacting seed material (rapeseed, claim 10) with an aqueous lower alkanol solvent solution (such as ethanol etc, claim 6) (at 20-50 °C) (solvent to solid ratios in the order of 4-10:1, col 4, lines 52-57) to thereby selectively extract glucosinolates, phenolic compounds and pigments therefrom at a temperature below 60 °C and under conditions so as to prevent oxidation of said phenolic compound and inhibiting enzymic degradation of glucosinolates; separating the liquid extract phase from a solid residue, drying (desolventized) the solid residue a at temperature below about 60 °C to thereby recover said protein concentration (claim 1). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24).

It would have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the antioxidant ascorbic acid in extracting process, wash rapeseeds with ethanol till no visible color is recovered, and inactivating myrosinase in Jones et al (US 4,158,656) due to the teaching in Jones et al as mentioned above.

Since all the inventions yielded beneficial results in food industry, one of ordinary skill in the art would have been motivated to make the modifications. Regarding the limitation to the result-effective adjustment in conventional working parameters is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. It would be obvious for one of the ordinary skills in the art to use the claimed 5000-10,000 molecular weight cut off membrane for diafiltration, as it will remove the numerous small phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments, and meanwhile prevent losing the target canola proteins. It would be obvious for one of the ordinary skills in the art to vary the amount of antioxidant during the canola protein isolation according to the temperature at which the isolation procedure is performed, or the volume of the solvent that is used during the protein isolation process. Thus, the amount of antioxidant, and membrane cut off point are result-effective variable that is subject to adjustment.

Claims 19, 20, 22-26, 28-36, and 38-45, 50-54 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Murray (US 6,005,076) in view of Jones et al (US 4,158,656), and further in view of Jones et al (US 6,146,449).

This rejection is maintained for reasons of record set forth in the Office Action mailed out on 10/12/2007, repeated below, slightly altered to take into consideration Applicant's amendment filed on 3/12/08. Applicants' arguments filed have been fully considered but they are not deemed to be persuasive.

Murray discloses a method for oil seed protein extraction (see the entire document). Murray teaches extracting rapeseed meal with an aqueous food grade salt solution at a pH of about 5-6.8 at a temperature of about 5-35 °C (col 8, lines 30-40); the extracting step is effected for about 10-60 min (col 8, lines 63-66); the crude protein solution was then chilled to 6 °C for 16 h (col 7, lines 5-8); separating the aqueous protein solution from residual oil seed meal; removing fat from the aqueous protein solution by chilling said aqueous protein solution to a temperature below about 15 °C (col 9, lines 21-26); the fat is separated by decanting, centrifugation and /or fine filtration (claim 7); the supernatant was diafiltered (col 7, lines 45-50), and then concentrated by using a selective ultrafiltration membrane with a molecular weight cut-off of 30,000 (col 7, lines 10-15; claim 13) at a temperature of about 20-45 °C (claim 15); increasing the protein concentration of said defatted protein solution while maintaining the ionic strength thereof substantially constant to form a concentrated defatted protein solution (claim 1d); it is preferred to use a volume reduction factor of about 3.0-about 10 (col 4, lines 55-60); the high protein liquid extract was diluted 10 fold in tap water (6 °C) (col 7, lines 19-21), diluting

the concentrated defatted protein solution to cause the formation of discrete protein particles in the aqueous phase (claim 8e, col 9, lines 32-36); settling the protein micelles to form a mass of protein isolate in the form of an amorphous sticky gelatinous, gluten-like protein micellar mass (claim 8f, col 8, lines 52-57); the micellar mass was allowed to settle for 4 h at 3 °C (col 7, lines 50-55); the dry (desolventized) protein micellar mass has a protein content, usually in excess of about 90% protein (calculated as kjeldahl N x 6.25) (col 6, lines 34-38). See Example 2 in particular.

Murray does not teach washing canola oil seed meal with an alcohol (ethanol), ratio of canola oil seed meal in solvent, wash till no visible color is recovered, diafilatration solution contains an antioxidant (ascorbic), pasteurizating step, or any claimed amounts of antioxidant, membrane cut off point.

Jones et al (US 4,158,656) teach a process for producing protein concentrate product from rapeseed (see Abstract). Jones et al indicate that the problem is that the rapeseed contains numerous phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments. These can cause an unattractive coloration and undesirable flavour in the food into which they are incorporated and, further, these phenolic compounds can be strongly bound to the protein and thereby diminish the nutritive value of the product (col 3, lines 25-33). The glucosinolates contained in rapeseed are hydrolysed by myrosinase under the appropriate conditions to isothiocyanates, nitriles, and oxazolidinethiones some of which are known to cause goiter. Rapeseed also contains a yellow pigment, the color

intensity of which is very much enhanced in alkaline environments, and such coloration is highly undesirable in many food products (col 3, lines 38-47). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24). Phenolics in the rapeseed flour are easily oxidized in alkaline and neutral solutions in the presence of oxygen and it is therefore essential that the extractions should be conducted in a non-oxidizing medium. It is preferable that the solution contains an antioxidant, such as sulphur dioxide, or ascorbic acid (col 4, lines 65-67; col 5, lines 1-5). Jones et al also teach contacting seed material (rapeseed, claim 10) with an aqueous lower alkanol solvent solution (such as ethanol etc, claim 6) (at 20-50 °C) (solvent to solid ratios in the order of 4-10:1, col 4, lines 52-57) to thereby selectively extract glucosinolates, phenolic compounds and pigments therefrom at a temperature below 60 °C and under conditions so as to prevent oxidation of said phenolic compound and inhibiting enzymic degradation of glucosinolates; separating the liquid extract phase from a solid residue, drying (desolventized) the solid residue a at temperature below about 60 °C to thereby recover said protein concentration (claim 1). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24).

Jones et al (US 6,146,449) teach a method for preparing the high protein nutrient from oilseed-based material. Jones et al indicate that after forming the modified oilseed product, it is typically advisable to pasteurize the material to ensure that microbial activity is minimized. The modified oilseed product may be pasteurized, e.g., by raising the internal temperature of the

product to about 75 °C, or above and maintaining that temperature for about 10-15 minutes (col 8, lines 42-50).

It would have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the antioxidant ascorbic acid in extracting process, wash rapeseeds with ethanol till no visible color is recovered, and inactivating myrosinase in Jones et al (US 4,158,656) due to the teaching in Jones et al as mentioned above.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to pasteurization step in Jones et al (US 6,146,449) as Jones et al teach that it is typically advisable to pasteurize the material to ensure that microbial activity is minimized.

Since all the inventions yielded beneficial results in food industry, one of ordinary skill in the art would have been motivated to make the modifications. Regarding the limitation to the amount of antioxidant, and membrane cut off point, the result-effective adjustment in conventional working parameters is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. It would be obvious for one of the ordinary skills in the art to use the claimed 5000-10,000 molecular weight cut off membrane for diafiltration, as it will remove the numerous small phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments,

and meanwhile prevent losing the target canola proteins. It would be obvious for one of the ordinary skills in the art to vary the amount of antioxidant during the canola protein isolation according to the temperature at which the isolation procedure is performed, or the volume of the solvent that is used during the protein isolation process. Thus, the amount of antioxidant, and membrane cut off point are result-effective variable that is subject to adjustment.

Claims 19, 20, 22-26, 28-36, and 38-54 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Murray (US 6,005,076) in view of Jones et al (US 4,158,656), and Jones et al (US 6,146,449), and further in view of Diosady et al (US 6,905,713).

This rejection is maintained for reasons of record set forth in the Office Action mailed out on 10/12/2007, repeated below, slightly altered to take into consideration Applicant's amendment filed on 3/12/08. Applicants' arguments filed have been fully considered but they are not deemed to be persuasive.

Murray discloses a method for oil seed protein extraction (see the entire document). Murray teaches extracting rapeseed meal with an aqueous food grade salt solution at a pH of about 5-6.8 at a temperature of about 5-35 °C (col 8, lines 30-40); the extracting step is effected for about 10-60 min (col 8, lines 63-66); the crude protein solution was then chilled to 6 °C for 16 h (col 7, lines 5-8); separating the aqueous protein solution from residual oil seed meal; removing fat from the aqueous protein solution by chilling said aqueous protein solution to a

temperature below about 15 °C (col 9, lines 21-26); the fat is separated by decanting, centrifugation and /or fine filtration (claim 7); the supernatant was diafiltered (col 7, lines 45-50), and then concentrated by using a selective ultrafiltration membrane with a molecular weight cut-off of 30,000 (col 7, lines 10-15; claim 13) at a temperature of about 20-45 °C (claim 15); increasing the protein concentration of said defatted protein solution while maintaining the ionic strength thereof substantially constant to form a concentrated defatted protein solution (claim 1d); it is preferred to use a volume reduction factor of about 3.0-about 10 (col 4, lines 55-60); the high protein liquid extract was diluted 10 fold in tap water (6 °C) (col 7, lines 19-21), diluting the concentrated defatted protein solution to cause the formation of discrete protein particles in the aqueous phase (claim 8e, col 9, lines 32-36); settling the protein micelles to form a mass of protein isolate in the form of an amorphous sticky gelatinous, gluten-like protein micellar mass (claim 8f, col 8, lines 52-57); the micellar mass was allowed to settle for 4 h at 3 °C (col 7, lines 50-55); the dry (desolventized) protein micellar mass has a protein content, usually in excess of about 90% protein (calculated as kjeldahl N x 6.25) (col 6, lines 34-38). See Example 2 in particular.

Murray does not teach washing canola oil seed meal with an alcohol (ethanol), ratio of canola oil seed meal in solvent, wash till no visible color is recovered, diafilatration solution contains an antioxidant (ascorbic), pasteurizating step, contacting PVP, or any claimed amounts of antioxidant, membrane cut off point, or PVP.

Jones et al (US 4,158,656) teach a process for producing protein concentrate product from rapeseed (see Abstract). Jones et al indicate that the problem is that the rapeseed contains numerous phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments. These can cause an unattractive coloration and undesirable flavour in the food into which they are incorporated and, further, these phenolic compounds can be strongly bound to the protein and thereby diminish the nutritive value of the product (col 3, lines 25-33). The glucosinolates contained in rapeseed are hydrolysed by myrosinase under the appropriate conditions to isothiocyanates, nitriles, and oxazolidinethiones some of which are known to cause goiter. Rapeseed also contains a yellow pigment, the color intensity of which is very much enhanced in alkaline environments, and such coloration is highly undesirable in many food products (col 3, lines 38-47). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24). Phenolics in the rapeseed flour are easily oxidized in alkaline and neutral solutions in the presence of oxygen and it is therefore essential that the extractions should be conducted in a non-oxidizing medium. It is preferable that the solution contains an antioxidant, such as sulphur dioxide, or ascorbic acid (col 4, lines 65-67; col 5, lines 1-5). Jones et al also teach contacting seed material (rapeseed, claim 10) with an aqueous lower alkanol solvent solution (such as ethanol etc, claim 6) (at 20-50 °C) (solvent to solid ratios in the order of 4-10:1, col 4, lines 52-57) to thereby selectively extract glucosinolates, phenolic compounds and pigments therefrom at a temperature below 60 °C and under conditions so as to prevent oxidation of said phenolic compound and inhibiting enzymic degradation of glucosinolates; separating the liquid extract phase from a solid residue, drying (desolventized)

the solid residue a at temperature below about 60 °C to thereby recover said protein concentration (claim 1). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24).

Jones et al (US 6,146,449) teach a method for preparing the high protein nutrient from oilseed-based material. Jones et al indicate that after forming the modified oilseed product, it is typically advisable to pasteurize the material to ensure that microbial activity is minimized. The modified oilseed product may be pasteurized, e.g., by raising the internal temperature of the product to about 75 °C, or above and maintaining that temperature for about 10-15 minutes (col 8, lines 42-50).

Diosady et al teach the production of high-quality protein isolates from defatted meals (see Title). In the process of isolating protein from canola meal, five grams of insoluble PVP was added to treat the solution for an hour, and then separated by filtration (col 23, lines 10-15).

It would have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the antioxidant ascorbic acid in extracting process, wash rapeseeds with ethanol till no visible color is recovered, and inactivating myrosinase in Jones et al (US 4,158,656) due to the teaching in Jones et al as mentioned above.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to pasteurization step in Jones et al (US 6,146,449) as Jones et al teach

that it is typically advisable to pasteurize the material to ensure that microbial activity is minimized.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the PVP in Diosady et al, as evidenced by Field, tannic acid content can be absorbed on PVP, thus the dark brown-black pigments could be removed.

Since all the inventions yielded beneficial results in food industry, one of ordinary skill in the art would have been motivated to make the modifications. Regarding the limitation to the amount of antioxidant, membrane cut off point, or PVP, the result-effective adjustment in conventional working parameters is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. It would be obvious for one of the ordinary skills in the art to use the claimed 5000-10,000 molecular weight cut off membrane for diafiltration, as it will remove the numerous small phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments, and meanwhile prevent losing the target canola proteins. It would be obvious for one of the ordinary skills in the art to vary the amount of antioxidant during the canola protein isolation according to the temperature at which the isolation procedure is performed, or the volume of the solvent that is used during the protein isolation process. Thus, the amount of antioxidant, and membrane cut off point are result-effective variable that is subject to adjustment.

Claims 19, 20, 22-26, 28-45, and 50-54 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Murray (US 6,005,076) in view of Jones et al (US 4,158,656), and Jones et al (US 6,146,449), and further in view of Holbrook et al (US 6,132,795).

This rejection is maintained for reasons of record set forth in the Office Action mailed out on 10/12/2007, repeated below, slightly altered to take into consideration Applicant's amendment filed on 3/12/08. Applicants' arguments filed have been fully considered but they are not deemed to be persuasive.

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high protein liquid extract was diluted 10 fold in tap water (6 °C) (col 7, lines 19-21), diluting the concentrated defatted protein solution to cause the formation of discrete protein particles in the aqueous phase (claim 8e, col 9, lines 32-36); settling the protein micelles to form a mass of protein isolate in the form of an amorphous sticky gelatinous, gluten-like protein micellar mass (claim 8f, col 8, lines 52-57); the micellar mass was allowed to settle for 4 h at 3 °C (col 7, lines 50-55); the dry (desolventized) protein micellar mass has a protein content, usually in excess of about 90% protein (calculated as kjeldahl N x 6.25) (col 6, lines 34-38). See Example 2 in particular.

Murray does not teach washing canola oil seed meal with an alcohol (ethanol), ratio of canola oil seed meal in solvent, wash till no visible color is recovered, diafilatration solution contains an antioxidant (ascorbic), pasteurizating step, extracting protein isolate with alcoholic solution, or any claimed amounts of antioxidant, membrane cut off point.

Jones et al (US 4,158,656) teach a process for producing protein concentrate product from rapeseed (see Abstract). Jones et al indicate that the problem is that the rapeseed contains numerous phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments. These can cause an unattractive coloration and undesirable flavour in the food into which they are incorporated and, further, these phenolic compounds can be strongly bound to the protein and thereby diminish the nutritive value of the product (col 3, lines 25-33). The glucosinolates contained in rapeseed are hydrolysed by myrosinase under the appropriate conditions to isothiocyanates, nitriles, and oxazolidinethiones

some of which are known to cause goiter. Rapeseed also contains a yellow pigment, the color intensity of which is very much enhanced in alkaline environments, and such coloration is highly undesirable in many food products (col 3, lines 38-47). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24). Phenolics in the rapeseed flour are easily oxidized in alkaline and neutral solutions in the presence of oxygen and it is therefore essential that the extractions should be conducted in a non-oxidizing medium. It is preferable that the solution contains an antioxidant, such as sulphur dioxide, or ascorbic acid (col 4, lines 65-67; col 5, lines 1-5). Jones et al also teach contacting seed material (rapeseed, claim 10) with an aqueous lower alkanol solvent solution (such as ethanol etc, claim 6) (at 20-50 °C) (solvent to solid ratios in the order of 4-10:1, col 4, lines 52-57) to thereby selectively extract glucosinolates, phenolic compounds and pigments therefrom at a temperature below 60 °C and under conditions so as to prevent oxidation of said phenolic compound and inhibiting enzymic degradation of glucosinolates; separating the liquid extract phase from a solid residue, drying (desolventized) the solid residue a at temperature below about 60 °C to thereby recover said protein concentration (claim 1). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24).

Jones et al (US 6,146,449) teach a method for preparing the high protein nutrient from oilseed-based material. Jones et al indicate that after forming the modified oilseed product, it is typically advisable to pasteurize the material to ensure that microbial activity is minimized. The modified oilseed product may be pasteurized, e.g., by raising the internal temperature of the

product to about 75 °C, or above and maintaining that temperature for about 10-15 minutes (col 8, lines 42-50).

Holbrook et al teach that vegetable protein concentrate or vegetable protein isolate is an alcohol extract or washed material since alcohol extraction provides a protein material especially suitable for use in a food material (col 5, lines 15-20). Holbrook et al also teach that vegetable materials which contain protein and isoflavones include oilseeds such as rapeseed etc (col 8, lines 64-67; col 9, lines 1-5).

It would have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the antioxidant ascorbic acid in extracting process, wash rapeseeds with ethanol till no visible color is recovered, and inactivating myrosinase in Jones et al (US 4,158,656) due to the teaching in Jones et al as mentioned above.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to pasteurization step in Jones et al (US 6,146,449) as Jones et al teach that it is typically advisable to pasteurize the material to ensure that microbial activity is minimized.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to extract canola protein isolate with aqueous alcoholic solution as

Holbrook et al teach that alcohol extraction provides a protein material especially suitable for use in a food material.

Since all the inventions yielded beneficial results in food industry, one of ordinary skill in the art would have been motivated to make the modifications. Regarding the limitation to the amount of antioxidant, and membrane cut off point, the result-effective adjustment in conventional working parameters is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. It would be obvious for one of the ordinary skills in the art to use the claimed 5000-10,000 molecular weight cut off membrane for diafiltration, as it will remove the numerous small phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments, and meanwhile prevent losing the target canola proteins. It would be obvious for one of the ordinary skills in the art to vary the amount of antioxidant during the canola protein isolation according to the temperature at which the isolation procedure is performed, or the volume of the solvent that is used during the protein isolation process. Thus, the amount of antioxidant, and membrane cut off point are result-effective variable that is subject to adjustment.

Claims 19, 20, 22-26, 28-54 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Murray (US 6,005,076) in view of Jones et al (US 4,158,656), and Jones et al (US 6,146,449), and further in view of Diosady et al (US 6,905,713), and Holbrook et al (US 6,132,795).

This rejection is maintained for reasons of record set forth in the Office Action mailed out on 10/12/2007, repeated below, slightly altered to take into consideration Applicant's amendment filed on 3/12/08. Applicants' arguments filed have been fully considered but they are not deemed to be persuasive.

Murray discloses a method for oil seed protein extraction (see the entire document). Murray teaches extracting rapeseed meal with an aqueous food grade salt solution at a pH of about 5-6.8 at a temperature of about 5-35 °C (col 8, lines 30-40); the extracting step is effected for about 10-60 min (col 8, lines 63-66); the crude protein solution was then chilled to 6 °C for 16 h (col 7, lines 5-8); separating the aqueous protein solution from residual oil seed meal; removing fat from the aqueous protein solution by chilling said aqueous protein solution to a temperature below about 15 °C (col 9, lines 21-26); the fat is separated by decanting, centrifugation and /or fine filtration (claim 7); the supernatant was diafiltered (col 7, lines 45-50), and then concentrated by using a selective ultrafiltration membrane with a molecular weight cut-off of 30,000 (col 7, lines 10-15; claim 13) at a temperature of about 20-45 °C (claim 15); increasing the protein concentration of said defatted protein solution while maintaining the ionic strength thereof substantially constant to form a concentrated defatted protein solution (claim 1d); it is preferred to use a volume reduction factor of about 3.0-about 10 (col 4, lines 55-60); the high protein liquid extract was diluted 10 fold in tap water (6 °C) (col 7, lines 19-21), diluting the concentrated defatted protein solution to cause the formation of discrete protein particles in the aqueous phase (claim 8e, col 9, lines 32-36); settling the protein micelles to form a mass of protein isolate in the form of an amorphous sticky gelatinous, gluten-like protein micellar mass

(claim 8f, col 8, lines 52-57); the micellar mass was allowed to settle for 4 h at 3 °C (col 7, lines 50-55); the dry (desolventized) protein micellar mass has a protein content, usually in excess of about 90% protein (calculated as kjeldahl N x 6.25) (col 6, lines 34-38). See Example 2 in particular.

Murray does not teach washing canola oil seed meal with an alcohol (ethanol), ratio of canola oil seed meal in solvent, wash till no visible color is recovered, diafilatration solution contains an antioxidant (ascorbic), pasteurizating step, or any claimed amounts of antioxidant, membrane cut off point, or PVP.

Jones et al (US 4,158,656) teach a process for producing protein concentrate product from rapeseed (see Abstract). Jones et al indicate that the problem is that the rapeseed contains numerous phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments. These can cause an unattractive coloration and undesirable flavour in the food into which they are incorporated and, further, these phenolic compounds can be strongly bound to the protein and thereby diminish the nutritive value of the product (col 3, lines 25-33). The glucosinolates contained in rapeseed are hydrolysed by myrosinase under the appropriate conditions to isothiocyanates, nitriles, and oxazolidinethiones some of which are known to cause goiter. Rapeseed also contains a yellow pigment, the color intensity of which is very much enhanced in alkaline environments, and such coloration is highly undesirable in many food products (col 3, lines 38-47). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a

myrosinase inactivating water treatment (col 1, lines 15-24). Phenolics in the rapeseed flour are easily oxidized in alkaline and neutral solutions in the presence of oxygen and it is therefore essential that the extractions should be conducted in a non-oxidizing medium. It is preferable that the solution contains an antioxidant, such as sulphur dioxide, or ascorbic acid (col 4, lines 65-67; col 5, lines 1-5). Jones et al also teach contacting seed material (rapeseed, claim 10) with an aqueous lower alkanol solvent solution (such as ethanol etc, claim 6) (at 20-50 °C) (solvent to solid ratios in the order of 4-10:1, col 4, lines 52-57) to thereby selectively extract glucosinolates, phenolic compounds and pigments therefrom at a temperature below 60 °C and under conditions so as to prevent oxidation of said phenolic compound and inhibiting enzymic degradation of glucosinolates; separating the liquid extract phase from a solid residue, drying (desolventized) the solid residue a at temperature below about 60 °C to thereby recover said protein concentration (claim 1). Jones et al further teach that it is known that thioglucodies can be removed from crushed oilseed by aqueous extraction following a myrosinase inactivating water treatment (col 1, lines 15-24).

Jones et al (US 6,146,449) teach a method for preparing the high protein nutrient from oilseed-based material. Jones et al indicate that after forming the modified oilseed product, it is typically advisable to pasteurize the material to ensure that microbial activity is minimized. The modified oilseed product may be pasteurized, e.g., by raising the internal temperature of the product to about 75 °C, or above and maintaining that temperature for about 10-15 minutes (col 8, lines 42-50).

Diosady et al the production of high-quality protein isolates from defatted meals (see Title). In the process of isolating protein from canola meal, five grams of insoluble PVP was added to treat the solution for an hour, and then separated by filtration (col 23, lines 10-15).

Holbrook et al teach that vegetable protein concentrate or vegetable protein isolate is an alcohol extract or washed material since alcohol extraction provides a protein material especially suitable for use in a food material (col 5, lines 15-20). Holbrook et al also teach that vegetable materials which contain protein and isoflavones include oilseeds such as rapeseed etc (col 8, lines 64-67; col 9, lines 1-5).

It would have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the antioxidant ascorbic acid in extracting process, wash rapeseeds with ethanol till no visible color is recovered, and inactivating myrosinase in Jones et al (US 4,158,656) due to the teaching in Jones et al as mentioned above.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to pasteurization step in Jones et al (US 6,146,449) as Jones et al teach that it is typically advisable to pasteurize the material to ensure that microbial activity is minimized.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the PVP in Diosady et al, as evidenced by Field, tannic acid content can be absorbed on PVP, thus the dark brown-black pigments could be removed.

It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to extract canola protein isolate with aqueous alcoholic solution as Holbrook et al teach that alcohol extraction provides a protein material especially suitable for use in a food material.

Since all the inventions yielded beneficial results in food industry, one of ordinary skill in the art would have been motivated to make the modifications. Regarding the limitation to the amount of antioxidant, membrane cut off point, or PVP, the result-effective adjustment in conventional working parameters is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan. It would be obvious for one of the ordinary skills in the art to use the claimed 5000-10,000 molecular weight cut off membrane for diafiltration, as it will remove the numerous small phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments, and meanwhile prevent losing the target canola proteins. It would be obvious for one of the ordinary skills in the art to vary the amount of antioxidant during the canola protein isolation according to the temperature at which the isolation procedure is performed, or the volume of the solvent that is used during the protein isolation process. Thus, the amount of antioxidant, and membrane cut off point are result-effective variable that is subject to adjustment.

The new limitations in claim 26 are met. First of all, Since Murray subject the same plant material to the same isolation and purification process as currently being claimed, the diafilteration process is deemed to remove the colour and phenolics as recited in the amended claims. Secondly, Murray is well aware the process of removing colour, as Murray states "ultrafiltration and similar selective membrane techniques permit low molecular weight species to pass there through while preventing higher molecular weight species from so doing. The low molecular weight species include not only the ionic species of the food grade salt but also low molecular weight materials extracted from the source material, such as, carbohydrates, **pigments** (the same as colour) etc. The molecular weight cut-off of the membrane is usually chosen to ensure retention of substantially all of the proteins in the solution" (col 5, lines 12-22). Furthermore, Murray explicitly teaches "canola protein isolate" in Fig.2.

The limitations in amended claim 19 are met since Jones et al also teach contacting seed material (rapeseed, claim 10) with an aqueous lower alkanol solvent solution (such as ethanol etc, claim 6) (at 20-50 °C) (solvent to solid ratios in the order of 4-10:1, col 4, lines 52-57) to thereby selectively extract glucosinolates, phenolic compounds and pigments therefrom at a temperature below 60 °C and under conditions so as to prevent oxidation of said phenolic compound and inhibiting enzymic degradation of glucosinolates; separating the liquid extract phase from a solid residue, drying (desolventized) the solid residue a at temperature below about 60 °C to thereby recover said protein concentration (claim 1).

From the teachings of the references, it is apparent that one of the ordinary skills in the art would have had a reasonable expectation of success in producing the claimed invention.

Thus, the invention as a whole is *prima facie* obvious over the references, especially in the absence of evidence to the contrary.

*This reference is cited merely to relay an intrinsic property and is not used in the basis for rejection *per se*.

Answer to Applicant's Argument

Applicant argues that "The Murray et al reference has no disclosure whereby the canola protein solution resulting from extraction of the canola oil seed meal and separated from residual meal, is subjected to concentration followed by diafiltration to remove colour and phenolics. The Examiner pointed to .Example 2, col. 7, wherein, in lines 46 to 48, reference is made to effecting diafiltration of the canola protein solution following by concentration, which is not the same as concentration of the canola protein solution followed by diafiltration, as recited in applicant's claims. No conditions for diafiltration step are described in Example 2 of Murray et al" (page 10, 2nd paragraph from the bottom). Applicant further argues that "While the Murray et al reference refers to effecting a diafiltration step, a step carried out at a different stage of operation from that specified in applicants claims, there is no guidance provided by the reference as to the process conditions to be employed in such operation in the context of obtaining a canola protein isolate of improved colour, as required by applicants claims" (page 11, last paragraph).

This is not found persuasive. First of all, Since Murray subject the same plant material to the same isolation and purification process as currently being claimed, the diafilteration process is deemed to remove the colour and phenolics as recited in the amended claims. Secondly, Murray is well aware the process of removing colour, as Murray states "ultrafiltration

and similar selective membrane techniques permit low molecular weight species to pass there through while preventing higher molecular weight species from so doing. The low molecular weight species include not only the ionic species of the food grade salt but also low molecular weight materials extracted from the source material, such as, carbohydrates, **pigments** (the same as colour) etc. The molecular weight cut-off of the membrane is usually chosen to ensure retention of substantially all of the proteins in the solution" (col 5, lines 12-22). In addition, although Example 2 itself does not teach the conditions for diafiltration step, Example 2 refers to Example 1, wherein Murray teaches "the high protein liquid extract was diluted 15 fold in tap water", which falls into the range of "2-20 volumes of diafiltration solution" in the amended claims.

Applicant argues that "The Examiner's indication that Murray yielded beneficial results in the pharmaceutical industry is not understood since neither Murray nor the present invention relate to pharmaceutical products" (page 10, 2nd paragraph from the bottom).

Applicant's argument is persuasive. Murray yielded beneficial results in food industry.

Applicant argues that "The Murray et al reference is silent as to improving the colour of the product canola protein isolate and does not specify the diafiltration conditions now specified in claim 26" (page 11, 2nd paragraph). Applicant further argues that "In addition, not only does Murray et at not disclose the steps of concentration of the canola protein solution followed by diafiltration using 2 to 20 volumes of diafiltration solution,-the reference also fails to disclose or

suggest the use of 5 to 10 volumes of diafiltration solution as specified in claim 28" (page 11, 3rd paragraph).

This is not found persuasive. Since Murray subject the same plant material to the same isolation and purification process as currently being claimed, the diafilteration process is deemed to improve the color as recited in the amended claims. Further more, in Example 1, Murray teaches "the high protein liquid extract was diluted 15 fold in tap water", which falls into the range of "2-20 volumes of diafiltration solution" in the amended claims.

Applicant argues that "Claim 29 requires that the extraction step is effected using a salt solution having a pH range of about 5 to 6.8 and that the diafiltration is effected using a diafiltration solution which is an aqueous salt solution having the same concentration and pH as the solution used in the extraction step. While Murray et al discloses that the extraction step may be effected using an aqueous salt solution having a pH in the range of about 5 to about 6.8, to the extent Murray et al discloses diafiltration, there is no disclosure or suggestion to use such solution as the diafiltration medium" (page 11, 3rd paragraph).

This is not found persuasive. Since Murray teaches "the aqueous food grade salt and the oil seed meal have a natural pH of about 5 to about 6.8 to enable the protein isolate to be formed", the diafiltration step is a process of protein isolate, and no pH alteration is taught by Murray regarding diafiltration process, thus the diafiltration step is performed at the claimed pH.

Applicant argues that "With respect to claim 30, this claim specifies that the diafiltration is effected using a membrane having a molecular weight cut-off in the range of about 3000 to

about 50,000 daltons. There is no disclosure in Murray et al of any such membrane for diafiltration" (page 11, 4th paragraph).

This is not found persuasive. Murray teaches using a selective ultrafiltration membrane with a molecular weight cut-off of 30,000 (col 7, lines 10-15; claim 13), which falls into the claimed range of about 3000 to about 50,000 daltons. In addition, it would be obvious for one of the ordinary skills in the art to use the claimed 5000-10,000 molecular weight cut off membrane for diafiltration, as it will remove the numerous small phenolic compounds which are readily oxidized and polymerized to condensed tannins which yield dark brown-black pigments, and meanwhile prevent losing the target canola proteins. It would be obvious for one of the ordinary skills in the art to vary the amount of antioxidant during the canola protein isolation according to the temperature at which the isolation procedure is performed, or the volume of the solvent that is used during the protein isolation process. Thus, the amount of antioxidant, and membrane cut off point are result-effective variable that is subject to adjustment.

Applicant argues that "Washing rapeseed itself with aqueous ethanol is not claimed but rather washing the meal with an alcohol is claimed (claim 36) (page 12, last paragraph). Applicant also argues that "In contrast, applicants use an alcohol, not an aqueous alkanol solution as in Jones '656, to extract phenolics and/or visible colour from the canola oil seed meal" (page 13, last paragraph).

The result-effective adjustment in conventional working parameters, such as determining the concentration of alcohol to wash rapeseed, is deemed merely a matter of judicious selection and routine optimization which is well within the purview of the skilled artisan.

Applicant argues that "The procedure described in Jones '669 for the preparation of an oil seed protein product is wholly different from applicant's process of preparing a canola protein isolate. There would appear to be nothing in the Jones "669 reference which would cause a person skilled in the art to modify the process described in the prior art to incorporate the pasteurization step claimed in claims 51 and 54" (page 14, last paragraph bridging page 15).

This is not found persuasive. Jones et al (US 6,146,449) teach a method for preparing the high protein nutrient from oilseed-based material. Since the claimed subject matter is canola oil seed meal, a person skilled in the art would have the motivation to use the teaching of the reference in the current invention.

Applicant argues that "The Examiner's referral to insert control is obscured. None of the present invention, Murray and Jones '656 is concerned with insect control. In the event the Examiner maintains this rejection, clarification of references to "pharmaceutical industry" and "insect control" is requested" (page 15, 6th paragraph).

Please disregard about the sentence about "insect control".

Applicant state that "The PPI is an isoelectrically precipitated product of the Diosady process, analogous to the protein micellar mass produced in applicant's process and in Murray. The PVP treatment step in Diosady is applied to the solution following separation from the PPI. The PVP treatment step in Diosady is not effected prior to separation of the protein isolate but rather subsequently and would be considered to be the equivalent of the treatment of the supernatant from the protein micellar mass produced herein and in the Murray reference" (page 17, 1st paragraph). Applicant argues that "Accordingly, there is no teaching in Diosady which suggests treatment of the diafiltered concentrated canola protein solution with PVP or other colour- adsorbing agent, prior to dilution to form the protein micelles" (page 17, 2nd paragraph).

This is not found persuasive. Diosady et al teach the production of high-quality protein isolates from defatted meals (see Title). In the process of isolating protein from canola meal, five grams of insoluble PVP was added to treat the solution for an hour, and then separated by filtration (col 23, lines 10-15). It would also have been *prima facie* obvious for one of ordinary skill in the art at the time the invention was made to use the PVP in Diosady et al, as evidenced by Field, tannic acid content can be absorbed on PVP, thus the dark brown-black pigments could be removed. In addition, KSR forecloses the argument that a specific teaching, suggestion, or motivation is required to support a finding of obviousness. See the recent Board decision Ex parte Smith, --USPQ2d--, slip op. at 20 (Bd. Pat. App.& Interf. June 25, 2007) (citing KSR, 82 USPQ2d at 1396) (available at http://www.uspto.gov/web/offices/dcom/bpai/prec/fd071925.pdf).

Applicant's arguments have been fully considered but they are not persuasive, and therefore the rejections in the record are maintained.

Conclusion

No claim is allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qiuwen Mi whose telephone number is 571-272-5984. The examiner can normally be reached on 8 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terry McKelvey can be reached on 571-272-0775. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

QM

/Patricia Leith/

Primary Examiner, Art Unit 1655